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DEPARTMENT OF MARINE AND FISHERIES

TORONTO

GENERAL METEOROLOGICAL REGISTER

FOR THE YEAR 1905.

DEPARTMENT OF MARINE AND FISHERIES—CANADA.

REMARKS ON THE METEOROLOGICAL RESULTS AT TORONTO FOR THE YEAR 1905.

TEMPERATURE.

The mean temperature of the year 1905 was 44°·53, being 0°·17 warmer than the average of 65 years, and 2°·29 warmer than 1904.

The mean temperature of the several months was in seven instances above and in five below the average for the respective months, the average defect to the average excess being in the ratio of 1°·1 to 0°·9. On each of 191 days the mean temperature was above the normal of that particular day and below on 174 days. The mean temperature of each month, with the difference from the normal, was: January, 17°·6–5°·0; February, 16°·7–5°·6; March, 30°·3+1°·3; April, 41°·2—0°·2; May, 52°·2—0°·3; June, 63°·1+0°·6; July, 69°·2+1°·4; August, 67°·1+0°·7; September, 61°·7+2°·9; October, 48°·5+1°·7; November, 36°·0—0°·3; December, 31°·2+4°·8. Dividing the year into the ordinary seasons we have for Winter, 18°·7; Spring, 41°·2; Summer, 66°·5; Autumn, 48°·7. The mean daily range for the year was 17°·0, the greatest monthly average occurring in August (19°·8) and the least in December (11°·1.) The greatest daily range (35°·6) occurred on the 13th of February and the least (4°·0) on the 22nd of March. The warmest month relatively was December, estimated by its excess above (4°·8) the normal. The warmest absolutely was July, 69°·2. February was the coldest relatively, the mean being (5°·6, below the normal; the coldest absolutely was also February (16°·7).

The climatic difference was 52°·5; the warmest day was the 18th July, mean temperature 81°·6, and the coldest the 3rd February, 0°·1, but the warmest day relatively was the 21st December, being 15°·7 above the normal, and the coldest the 3rd Febrary, 22°·6 below the normal; the average temperature of the warmest and coldest days from former years was 78°·2 and 2°·2 below zero. The highest temperature of the year (92°·1) occurred on the 18th July, and the lowest (8°·2 below zero) on the 4th of February. The annual range from these extremes was 100°·3, being 7°·8 less than 1904, and 3°·0 less than the average annual range. There were only eleven instances in which the temperature at the hour of observation was 20°·0 above the normal and 29 when a defect of an equal amount occurred. The most striking deviations from the daily normal curve of temperature have been as follows:—

IN EXCESS.

		°			°
January	1	14·8	October	1	13·4
"	19	12·4	"	4	13·0
March	27	14·8	"	10	12·7
"	29	14·6	November	24	12·6
"	30	12·8	December	20	12·8
July	18	13·2	"	21	15·7
September	19	12·5	"	22	13·9
"	29	13·3	"	27	14·3
"	30	12·8	"	28	13·5
			"	29	14·1

IN DEFECT.

		°			°
January	3	14·9	February	13	13·6
"	14	13·9	"	14	18·9
"	25	17·6	"	15	21·8
"	26	16·7	"	18	16·0
"	28	14·5	March	10	12·5
February	2	16·2	"	13	12·9
"	3	22·6	November	30	13·9
"	4	20·5	December	14	15·9
"	7	16·3	"	15	13·7
"	11	13·5			

BAROMETRIC PRESSURE.

The mean height of the barometer was 29·627 inches, being 0·008 inches above the average. The month which showed the greatest deviation from the normal was February 0·105 in excess. December showing the least 0·003. Average deviation without reference to sign was small, being only 0·044. The highest reading was 30·493 at 8 a.m. of December 1st; and the lowest 28·840 at 10 p.m. December 29th, giving a range of pressure of 1·653 inches.

The number of days of large abnormal variations in which the average pressure differed by two-tenths and upwards from the normal was 115, the greatest number (17) occurring in January and April and the least (1) in June and August.

HUMIDITY.

The mean humidity of the year was 78, being 1 above the average. The greatest monthly humidity was 85 in February, and the least 66 in April. There were 16 cases of complete saturation at the hour of observation: 4 in January, 11 in February, and 1 in November. The least humidity of the year at the hour of observation was 26 at 2 p.m. on the 21st April.

CLOUDS.

The extent of the sky clouded was on the average of the year six-tenths of the whole. August was the clearest month and December the most cloudy. During the year there were 59 days completely clouded, being 2 below the average (1882-1904) the greatest number (14) occurring in December; none being registered in the month of May.

WIND.

The resultant direction of the wind was S. 87° W., showing 26° more southing than 1904, and 4° more southing than in the seventeen years to 1890. The mean velocity of the wind without reference to direction was 9·72 miles. The most windy month was January, with an average of 13·40 miles per hour, and the least windy was June, with an average of 6·90 miles. The windiest day was February 14th, average velocity 26·92 miles per hour, and the day of least velocity December 8th, average velocity 0·00 miles per hour. The highest velocity in one hour was 54·0 miles, 1 to 2 p.m. of the 20th October.

RAIN AND SNOW.

The total depth of rain that fell during the year was 25·825 inches, being 1·217 inches less than the average, and 4·215 inches less than the rain fall of 1904. The depth of snow 54·3 inches, was 12·53 inches less than the average, and 2·2 inches less than the snowfall of 1904. July was the most rainy month as to quantity (4·715), and with reference to the number of rainy days, May was the most rainy month; only 0·060 inches fell in February.

The day of greatest rainfall was the 15th August, when 3·680 inches fell. There were only 2 other days during the year on which over 1 inch fell.

The heaviest fall of snow was 6·6 inches on the 7th of January. Rain fell on 97 days, being 6 less than the average number, and 3 less than in 1904; snow fell on 49 days, being 15 less than the average and 4 less than in 1904.

THUNDERSTORMS.

Of the 30 thunderstorms occurring during the year, the first was on the 10th of February, and the last on November 28th, 1 occurred in February, 2 in April, 4 in May, 7 in June, 7 in July, 4 in August, 2 in September, 2 in October and 1 in November. The most severe storms were on May 5th, June 2nd, 7th, 18th, July 4th, 30th and October 20th. Lightning alone on June 1st, 5th, July 5th, 18th, August 7th, .6th, September 15th, 21st. Hail fell on March 16th and October 12th.

AURORA.

Auroral displays were very few. Of the 6 observed 1 of the 4th class occurred in April and 1 in July, of the 3rd class, 1 occurred in March, 1 in August and 2 in September There were 196 nights favourable for observation.

SUNSHINE

The total duration of bright sunshine during the year was 2064·2 hours ; number of hours the sun was above the horizon, 4464·1, ratio of registered to possible, 0·46.

GENERAL METEOROLOGICAL

MAGNETICAL OBSERVATORY,

Latitude 43° 40′ N. Longitude 5h. 17m. 34·65s. W. Elevation

	JAN.	FEB.	MAR.	APRIL.	MAY.	JUNE.	JULY.
Average temperature	17°·16	16°·74	30°·29	41°·16	52°·23	63°·14	69°·20
Difference from average (65 years)	– 5·02	– 5·56	+ 1·26	– 0·19	– 0·30	+ 0·61	+ 1·38
Thermic Anomaly (Lat. 43° 40′)	–15·64	–17·96	– 9·81	– 9·04	– 5·87	– 1·46	+ 0·50
Highest temperature	42·1	37·8	64·0	67·0	75·6	85·2	92·1
Lowest temperature	– 7·1	– 8·2	5·7	24·0	31·9	39·9	51·3
Monthly and annual ranges	49·2	46·0	58·3	43·0	43·7	45·3	40·8
Average maximum temperature	25·82	25·34	38·68	51·13	62·52	73·44	78·80
Average minimum temperature	10·42	7·68	22·52	33·17	42·92	53·73	60·57
Average daily range	14·90	17·66	16·16	17·96	19·60	19·71	18·23
Greatest daily range	24·2	35·6	28·7	31·2	33·3	28·9	26·9
Average height of barometer at 32°Fah.	29·7218	29·7384	29·7109	29·4982	29·5796	29·5674	29·5530
Difference from average (64 years)	+ ·0767	+ ·1049	+ ·1029	– ·1029	+ ·0016	– ·0048	– ·0337
Highest barometer	30·305	30·251	30·225	30·110	29·824	29·853	29·848
Lowest barometer	28·944	29·090	29·207	29·058	29·227	29·195	29·339
Monthly and annual ranges	1·361	1·161	1·018	1·052	0·597	0·658	0·509
Average humidity of the air	84	85	79	66	71	76	76
Difference from average	+ 1	+ 4	+ 1	– 4	+ 1	+ 3	+ 4
Average of cloudiness	0·74	0·56	0·55	0·58	0·56	0·59	0·55
Difference from average	·00	+10	– ·08	·00	– ·01	+ ·07	+ ·06
Resultant direction of wind	W 1° N	S 83° W	N 34° W	N 84° W	S 81° W	N 40° W	N 71° W
Resultant velocity of wind	4·13	5·13	2·05	4·83	0·87	1·40	1·44
Average velocity (miles per hour)	13·40	13·16	8·70	10·97	9·32	6·90	8·55
Difference from average	+ 0·84	+ 0·16	– 3·89	– 0·27	– 0·32	– 1·50	+ 0·70
Highest velocity in month and year.	39·0	43·0	23·0	31·0	29·0	30·0	22·0
Total amount of rain in inches	0·625	0·060	0·335	1·075	3·230	3·185	4·715
Difference from average (65 years)	– 0·531	– 0·856	– 1·162	– 1·097	+ 0·247	+ 0·384	+ 1·712
Number of days of rain	3	1	4	4	15	14	14
Total amount of snow in inches	26·5	13·7	1·7	3·5	....	....	....
Difference from average (65 years)	+ 9·31	– 3·26	– 9·98	+ 1·04	– 0·11	....	....
Number of days of snow	17	13	4	3	....	....	....
Number of fair days	8	12	18	17	15	16	15
Number of days completely clouded	13	4	7	4	0	3	2
Number of auroras observed	0	0	1	1	0	0	1
Possible to see auroras (No. of nights)	8	15	17	20	18	16	21
Number of thunder storms	0	1	0	2	4	7	7
Number of fogs	1	1	0	1	4	8	3
Number of hours of bright sunshine	83·8	116·7	166·9	180·2	218·6	217·5	265·7
Number of hours of possible sunshine	299·9	294·0	369·7	402·8	456·8	461·9	468·1

REGISTER FOR THE YEAR 1905.

TORONTO, ONTARIO.

above Lake Ontario 108 feet. Elevation above the Sea, 350 feet.

AUG.	SEPT.	OCT.	NOV.	DEC.	1905	1904	1903	1902	1901	1900	1899
67°·08	61°·74	48°·47	36°·04	31°·16	44°·53	42°·20	45°·58	45°·57	45°·55	46°·89	45°·83
+ 0·73	+ 2·91	+ 1·69	− 0·28	+ 4·82	+ 0·17	− 2·16	+ 1·22	+ 1·21	+ 1 19	+ 2·53	+ 1·47
− 1·42	+ 0·24	− 5·33	− 7·16	− 4·84	− 6·49	− 8·82	− 5·44	− 5·45	− 5·47	− 4·13	− 5·19
88·8	83·2	78·0	54·0	45·9	92·1	93·0	91·5	91·0	97·1	98·0	92 1
48·9	31·0	25·2	12·7	6·9	− 8·2	−15·1	− 9·7	− 3·3	−10·9	− 9·6	−12·0
39·9	52·2	52·8	41·3	39·0	100·3	108·1	101·2	94·3	108·0	107·6	104·1
77·41	71·52	57·35	43·61	36·81	....	....	....	....	....	....	....
57·65	53·07	40·22	30·15	25·72	....	....	....	....	....	....	....
19·76	18·45	17·13	13·46	11 09	17·01	17·29	16·68	16·81	16·90	16·70	17·51
26·8	30·9	31·2	27·8	22·5	35·6	36·0	34·5	33·2	43·0	37·6	35·0
29·5907	29·6474	29·6750	29·59·8	29·6460	29·6273	29·6380	29·6203	29·5940	29·5988	29·6213	29·6368
− ·0262	− ·0189	+ ·0251	− ·0271	− ·0003	+ ·0081	+ ·0188	+ ·0011	− ·0204	− ·0204	+ ·0021	+ ·0176
29·847	30·130	30·269	30·395	30·493	30·493	30·449	30·309	30·394	30·328	30·224	30·403
29·221	29·347	29·138	28·923	28·840	28·840	28·752	28·742	28·712	28·868	28·802	28·657
0·626	0·683	1·131	1·472	1·653	1·653	1·697	1·567	1·682	1·460	1·422	1·746
76	79	79	77	84	78	79	76	77	77	76	76
+ 2	+ 1	0	− 3	+ 2	+ 1	+ 2	− 1	0	0	− 1	− 1
0·44	0·49	0·53	0·63	0·80	0·58	0·60	0·61	0·62	0·61	0·57	0·56
− ·06	− ·01	− ·09	− ·11	+ ·04	− ·03	− ·01	− ·00	+ ·01	·00	− ·04	− ·05
S 53° W	S 82° W	S 77° W	S 74° W	S 71° W	S 87° W	N 67° W	W	N 60° W	N 55° W	S 88° W	S 77° W
1·36	1·34	2·34	5·78	4·81	2·73	2·09	2·45	2·53	2·99	3·09	2·66
7·95	7·05	7·95	11·59	11·14	9·72	10·17	10·83	10·98	10·26	10·97	10·14
+ 0.14	− 0·96	− 1·28	+ 0·56	− 1·83	− 0·64	− 0·19	− 0·47	+ 0·62	− 0·10	+ 0·61	− 0·22
27·0	28·0	54·0	39·0	28·0	54·0	50·0	40·0	44·0	45·0	44·0	50· 0
4·220	1·725	3·485	1·500	1·670	25·825	30·040	25·631	26·105	25·200	22·130	25·795
+ 1·410	− 1·490	+ 1·079	− 1·028	+ 0·115	− 1·217	+ 2·998	− 1·411	− 0·937	− 1·842	− 4·912	− 1·247
4	12	10	11	5	97	100	100	116	102	99	105
....	....	*	2·8	6·1	54·3	56·5	50·0	49·2	70·7	74·6	31·8
....	....	− 0·64	− 1·86	− 7·03	−12·53	−10·33	−16·83	−17·63	+ 3·87	+ 7·77	−35·03
....	....	....	4	8	49	53	52	37	54	42	40
22	18	19	18	6	190	175	171	181	183	187	185
1	2	5	4	14	59	61	61	59	58	51	44
1	2	0	0	0	6	2	5	2	2	3	10
21	17	19	18	6	196	177	184	185	201	224	226
4	2	2	1	0	30	37	26	34	29	34	29
1	0	3	0	1	23	26	22	31	29	29	31
266·1	214·5	159·4	107·1	67·7	2064·2	1964·9	2039·9	1958·9	1981·6	2305·0	2148·2
433·3	364·4	342·5	291·5	279·2	4464·1	4475·2	4464·1	4464·1	4464·1	4464·1	4464 1

TEMPERATURE.

——	1905.	Average of 65 years.	Extremes.	
	°	°		°
Average temperature of the year	44·53	44·36	47·15 in 1898	40·77 in 1875
Warmest month	July	July	July, 1868	Aug. 1860
Average temperature of the warmest month	69·20	67·82	75·80	64·46
Coldest month	February	January	Feb. 1875	Feb. 1848
Average temperature of the coldest month.	16·74	22·18	10·16	26·62
Difference between the temperature of the warmest and coldest months	52·46	45·64	....	
Average of deviations of monthly means from their respective average of 65 years, signs of deviations being disregarded	2·06	2·72	3·54	
Month of greatest deviation without regard to sign	February	January	Feb. 1875	
Corresponding magnitude of deviation	5·56	3·86	12·14	
Warmest day	18 July	....	July 14, 1868	July 31, 1844
Average temperature of the warmest day .	81·57	78·24	84·50	72·75
Coldest day	3 Feb.	....	Feb. 6. 1855 Jan. 22. 1857	Dec. 22 ·42
Average temperature of the coldest day	0·10	—2·24	—14·38	9·57
Date of the highest temperature	18 July	....	Aug. 24 1854	Aug. 19, 1840
Highest temperature	92·1	91·29	99·2	82·4
Date of lowest temperature	4 Feb.	....	Jan. 10, 1859	Jan. 2. 1842
Lowest temperature	—8·2	—12·04	—26·5	1·9
Range of the year	100·3	103·33	118·2	87·0

BAROMETER.

——	1905.	Average of 64 years.	Extremes.	
	in.	in.	in.	in.
Average pressure of the year	29·6273	29·6192	29·6670 in 1849	29·5596 in 1864
Month of the highest average pressure	February	September	Jan. 1849	June, 1864
Highest monthly average pressure	29·7384	29·6663	29·8030	29·6245
Month of the lowest average pressure	April	June	March, 1859	Nov. 1849
Lowest monthly average pressure	29·4982	29·5722	29·4125	29·5868
Date of the highest pressure of the year	1st Dec.	....	Jan. 8, 1866	Mar. 17, 1878
Highest pressure	30·493	30·361	30·940	30·139
Date of the lowest pressure of the year	29 Dec.	....	Jan. 2, 1870	June 2, 1894
Lowest pressure	28·840	28·707	28·166	29·035
Range for the year	1·653	1·654	2·420 in 1893	1·303 in 1845

RELATIVE HUMIDITY.

——	1905.	Average of 64 years.	Extremes.	
Average humidity of the year.	78	77	82 in 1851	73 in 1858-71
Month of greatest humidity	Feb.	January	Dec., 1878	Dec., 1858
Greatest average monthly humidity	85	83	94	81
Month of least humidity	April	May	Feb. 1843	April, 1849
Least average monthly humidity	66	70	58	76

EXTENT OF SKY CLOUDED.

—	1905.	Average of 52 years.	Extremes.	
Average cloudiness of the year	0·58	0·61	0·66 in '69 '76	0·56 in 1899
Most cloudy month	December	December	...	...
Greatest monthly average cloudiness	0·80	0·76	0·89	0·73
Least cloudy month	August	July	...	...
Least monthly average of cloudiness	0·14	0·49	0·29	0·51

WIND.

—	1905.	Average of 17 years.	Extremes.	
Resultant direction	S. 87° W.	N. 61° W.	...	...
Resultant velocity in miles	2·73	2·51	...	...
Average velocity without regard to direction	9.72	9·64	12·33 in 1897	8·32 in 1878
Month of greatest average velocity	January	March	Feb., 1897	Dec., 1875
Greatest monthly average velocity	13·40	11·19	17·01	10·42
Month of least average velocity	June	July	July, 1878	July, 1881
Least monthly average velocity	6·90	7·56	5·93	8·43
Day of greatest average velocity	14th Feb.	...	Nov. 17, 1870	Feb. 10, 1885
Greatest daily average velocity	26·92	28·98	41·67	22·79
Day of least average velocity	8th Dec.	...	...	...
Least daily average velocity	0·0	...	...	...
Hour of greatest absolute velocity	20th Oct. 1 to 2 p.m.	... ...	Dec. 1. 1895 9 to 10 a.m.	Jan. 17. 1885 10 to 11 a.m.
Greatest velocity	54·0	45·67	64·0	39·0

Note.—During the year 1905, the wind has been partly obtained from the Records of the anemograph at Stanley Barracks, and no comparison has been made with the results of former years.

RAIN.

—	1905.	Average of 65 years.	Extremes.	
Total depth of rain in inches	25·825	27·042	43·555 in '43	17·574 in '74
Number of days on which rain fell	97	113	145 in 1890	80 in 1841
Month in which the greatest depth of rain fell	July	September	Sept., 1843	June, 1887
Greatest depth of rain in one month	4·715	3·215	9·760	2·655
Month in which the days of rain were most frequent	May	October	May, 1890	May, 1841
Greatest number of rainy days in one month	15	13	23	11
Day on which the greatest amount of rain fell	15th Aug.	...	July 27, 1897	Sept. 14, '48
Greatest amount of rain in one day	3·680	1·924	3·881	1,000

SNOW.

——	1905	Average of 62 years.	EXTREMES.	
Total depth of snow in inches	51·3	66·8	122·9 in 1870	31·8 in 1899
Number of days on which snow fell	49	64	87 in 1859	33 in 184
Month in which the greatest depth of snow fell	January	January	Mar., 1870	Feb., 1851
Greatest depth of snow in one month	26·5	17·2	62·4	10·7
Month in which the days of snow were most frequent	January	January	Dec. 1872.	Feb., 1848
Greatest number of days of snow in one month	17	11	24	8
Day in which the greatest amount of snow fell	7th Jan'y	....	Feb. 5, 1863 Mar. 28, 1876	Jan.4-6-'88.
Greatest fall of snow in one day	6·6	9·0	16·2	3·0

SUNSHINE.

——	1905	Average 1882 to 1904
Total duration of bright sunshine in hours	2061·2	2052·4
Ratio to possible amount	0·46	0·46
Month of greatest relative amount	August.	July.
Ratio to possible amount	0·61	0·60
Month of least relative amount	December.	December.
Ratio to possible amount	0·24	0·22
Number of days completely clouded	58	61
Day of greatest relative amount	Feb. 18	....
Ratio to possible amount	0·94	0·91

DIFFERENCES OF CERTAIN METEOROLOGICAL ELEMENTS FOR 1905 FROM THE NORMAL VALUES FOR EACH QUARTER AND YEAR.

——	Bar.	Tem.	Rain.	Days Rain.	Snow.	Days Snow.	Clouded Sky.
	in.	° ′	in.		in.		p.c.
Winter	+·0453	−4·94	−2·215	−10·05	− 0·08	− 4·70	− ·05
Spring	+·0005	+0·26	−2·012	− 5·57	− 9·05	− 0·79	− ·03
Summer	−·0216	+0·91	+3·506	− 1·73	....	....	+ ·02
Autumn	+·0111	+1·44	−1·541	+ 1·22	− 2·05	− 5·25	− ·07
Year	+·0088	−0·58	−2·262	−16·13	−11·63	−10·74	− ·03

NOTE.—The quarters and year in this table are from the preceding December to 30th November.

PERIODICAL OR OCCASIONAL EVENTS 1905.

January......	5.	First sleighing.
February.....	3.	Coldest day of year. Mean temperature—0·1. 9th, Large flock of Bohemian Wax-wings. 10th, First thunderstorm of year. 18th. Lowest water in year, 3 in. below zero.
March.......	18.	Robins, Flickers. 20th, Song Sparrow. 23rd, Blue Birds, Bronze Grackles. 25th, Reed Birds, Butterflies. Don open, no flood. 28th, Ducks, Geese. 29th, Crocus and Snowdrop in bloom.
April........	1.	Meadow Larks, Kingfishers. 3rd, Earth worms, frost out of ground. 4th, Hermit Thrush, Phœbe Junco, first Vessel arrived. 5th, Soft maple in bloom, Bay clear of ice, had been closed 115 days. 9th, Row boats on bay. 13th, Brown Creeper 21st, Last snow. 22nd, Towhee, Tree Sparrow. 24th, Hepatica in bloom, Frogs piping. 26th, Chipping Sparrow, Swallows. 29th, Aspen and Willows shedding pollen.
May.........	1.	Dandelion in bloom. 2nd, Bobolink. 3rd, Trillium. 4th, Violet. 5th, Oriole, Whip-poor-will. Pear in bloom. Cherry in bloom. May bugs. 6th, Maple. 7th, Chestnut in bloom, Yellow birds. 8th, Tulips. 20th, Apple in bloom. 21st, Last frost, large number of scarlet tanagers on sand bar. 23rd, 10 p.m., Large meteor from N.W. towards S.S.E.
June........	23.	Large flocks of Blackbirds about.
July........	18.	Warmest day of year, mean temperature 81°·6, highest, 92°·1.
August.....	12.	Very heavy rain S. of King street. 15th, Heaviest rain storm of year, 3·68 in. fell. Highest water in year, 28 in. above zero.
September..	7.	At 3 p. m. very heavy rain just east of city limits. 26th, First frost.
October.....	26.	First snow.
November..	1.	First measureable snow. 21st, Don frozen. 28th, Last thunder.
December..	25.	Last vessel arrived ; year closed very mild, Bay open to end.